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Docket No. LPTF06
US App. No. 10/510,195

REMARKS**Status of the Application**

Claims 1, 2, and 18-25 were previously pending. Claims 20 and 23 were objected to for informalities. Claims 1, 2, and 18-25 were rejected both under 35 USC 112, second paragraph. Claim 1 was rejected under 35 USC 102(b) as being anticipated by Richard et al. (US 5,611,399), or Voll et al. (US 5,624,560). Claims 2, 18 and 19 were rejected under 35 USC 103(a) as being unpatentable over Richard or Voll in view of Whitlock et al. (US 6,006,829). Claims 20-22, 24 and 25 were rejected under 35 USC 103(a) as being unpatentable over Richard in view of Whitlock. Claim 23 was rejected under 35 USC 103(a) as being unpatentable over Richard in view of Whitlock as applied to claim 20, and further in view of Ilfrey et al. (US 5,858,691). The drawings were objected to for informalities.

Applicant has amended claims 1, 18, 19, and 21-25, canceled claims 2 and 20, and added new claims 26. Applicant has also amended Fig. 6. No new matter adds through the amendments. For the reasons discussed below, withdrawal of the rejections is requested.

Drawings

The drawings were objected to for including reference number 2 in Fig. 6 that is not described in the specification.

Applicant has amended Fig. 6 to delete reference number 2.

Withdrawal of the objection is requested.

Claim Objections

Claims 20 and 23 were objected to for informalities.

Applicant has amended claim 23 and canceled claim 20.

Withdrawal of the objection is requested.

Claim Rejections- 35 U.S.C. 112, Second Paragraph

Claims 1, 2, and 18-25 were rejected under 35 USC 112, second paragraph.

Applicant has carefully reviewed and amended the claims. It is believed the amendments made to the claims overcome the rejections.

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Withdrawal of the rejection is requested.

Claim Rejections- 35 U.S.C. 102(b)

Claim 1 was rejected under 35 USC 102(b) as being anticipated by Richard et al. (US 5,611,399), or Voll et al. (US 5,624,560).

Applicant respectfully traverses the rejection for reasons discussed below. Nevertheless, claim 1 has been amended

In Richard, the sand control screen consists of two filtration layers, wherein the outer layer is a metal fine screen 22, and the inner layer is a wound wire layer 14. The metal fine screen has longitudinal seams connected with each other by overlapped joints. The wound wire layer supports the metal fine screen and acts as the second sand control mesh layer. Figs. 2 and 3, Col. 3, lines 1-35. But, the above metal fine screen pipe has lower joint intension at the longitudinal seam and weak resistance against the inner pressure, and is prone to damages which results in the failure of sand controlling. The wound wire layer demands high precision in seam width, which needs costly dedicated equipment. As a result, the cost of manufacturing the sand control screen pipe is very high.

In the present application as defined in claim 1, the bottom diffusion mesh has a mesh structure and is provided for diffusing filtrated fluid, which is different from the a wound wire layer 14 of Richard which is used to support the metal fine screen 22 in a particular way as shown in Fig. 10. The twill weave meshes of the present invention do not need to form longitudinal seams thereon. Further, the amended claim 1 recites an inter-layer diffusion mesh positioned between two twill weave meshes for diffusing filtrated fluid. Richard is totally silent about this feature.

For at least the above reasons, Richard cannot anticipate claim 1.

Voll discloses a filter apparatus comprising a supporting body, a woven wire mesh mounted on the supporting body, a wire-wrap inner jacket mounted on the supporting body and placed between the supporting body and the woven wire mesh. The wire-wrap inner jacket 12 (the Examiner regards it as equivalent to the bottom diffusion mesh in Claim 1) is wrapped by wires, as shown in Figs. 1 and 2 in Voll. However, the bottom diffusion mesh 20 has a mesh structure, which is structurally different from the wire-wrap inner jacket 12 of Voll.

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Further, It is stated, on Col. 3, lines 18-20 of Voll's patent, that the wire-wrap inner jacket 12 is to support the woven wire mesh layer 14 in the areas over the perforation holes 11 in the supporting body 10, thereby improving the damage resistance of the woven wire mesh layer 14 against erosion and collapse. Therefore, the function of the wire-wrap inner jacket 12 is different from that of the bottom diffusion mesh which is applied for diffusing the filtrated fluid, thereby increasing the seeping flow area. Voll also fails to teach or suggests an inter-layer diffusion mesh positioned between two twill weave meshes for diffusing filtrated fluid as recited in claim 1.

For at least the reasons discussed above, Voll cannot anticipate claim 1.

Withdrawal of the rejections is requested.

Claim Rejections- 35 U.S.C. 103(a)

Claims 2, 18 and 19 were rejected under 35 USC 103(a) as being unpatentable over Richard or Voll in view of Whitlock et al. (US 6,006,829).

Claim 2 has been canceled. The amended claim 1 contains features recited in the original claim 2.

The Office Action acknowledged that Richard and Voll fail to teach two or more layers of the twill weave meshes and an inter-layer diffusion mesh between them, but cited Whitlock to teach the missing elements.

Whitlock discloses a filter with an erosion barrier for subterranean environment, which comprises a filter body 20 disposed around an inner support member 10. As shown in Figs. 2 and 3, the filter body 20 includes an inner drainage layer 21 in the form of a mesh surrounding the inner support member 10, and a filtering portion 22 containing one or more filtering layers 23 of a sintered supported porous stainless steel filter medium. An erosion barrier 25 is disposed on the filtering layers 23, which includes perforated energy absorbing layers 26 and a drainage layer 27. Col. 5, lines 38-67. The Examiner takes the drainage layer 27 as equivalent to the inter-layer diffusion mesh of claim 1. However, Whitlock does not teach the drainage layers 27 is formed between two twill weave filtering layers. Also, the filtering layers 23 are not twill weave meshes. In fact, none of Richard, Voll, and Whitlock has taught the use of two or more layers of twill weave meshes, let alone an inter-layer diffusion mesh between two twill weave meshes.

For the reasons discussed above, claim 1 is patentable over of Richard, Voll, and Whitlock. Claims 18-19 depend from claim 1 and, thus, are also patentable over Richard, Voll, and

Whitlock for at least the same reasons.

In addition, claims 18 and 19 contain features that further distinguish over the cited references. For example, claim 18 recites a metal fiber layer fixed made of weaving metal wires with 0.05-0.30 mm in diameter, and the thickness of the metal fiber layer is 3-30 mm. Whitlock fails to teach that the "metal fiber layer" 27 has such features.

Claim 19 recites that the bottom diffusion mesh has a mesh size of 5-50 mesh and the inter-layer diffusion mesh has a mesh size of 10-60 mesh. Clearly, none of the cited references teaches or even remotely suggests these features. In such filtering systems as that of the present invention, dimension and mesh size of the filter layer not only matters, but is of great importance, which directly affect the filtering efficiency and results.

Claims 20-22, 24 and 25 were rejected under 35 USC 103(a) as being unpatentable over Richard in view of Whitlock.

Claim 20 has been canceled and a corresponding new claim 26 is added which is fully supported by the specification (See page 10, lines 2-27, and Figs. 6 and 7). The following is a discussion of the new claim 26.

In addition to the differences between the composite metallic filtering mesh of claim 26 (which is similar to that of claim 1) and that of Richard as discussed above, claim 26 recites other elements that are not taught by Richard and Whitlock. For example, claim 26 recites "a tubular inner protective shroud with through holes distributed on its surface, disposed on the pipe body and covering over the through holes of the pipe body, two ends of the tubular inner protective shroud being fixed to the pair of first supporting rings, respectively". The Office Action regards supporting member 16 of Richard as equivalent to the tubular inner protective shroud of the present invention. However, the supporting member 16 are longitudinally extending, elongated, individual members circumferentially spaced along the outer surface of the base pipe 10 and tied together by a wound wire 18, and forms the coarse screen 14 together with the wound wire 18. (Col. 2, lines 58-62, Figs. 3 and 4). Clearly, the supporting member 16 is totally different from the tubular inner protective shroud as recited in claim 26, which is fixed to the pair of first supporting rings at its two ends.

For at least the reasons discussed above, claim 26 is patentable over Richard and Whitlock. Claims 21-22 depend from claim 26 and, thus, are also patentable over Richard and Whitlock for

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at least the same reasons.

In addition, claims 21 and 22 contain features that further distinguish over the cited references. For example, claim 21 recites a metal fiber layer fixed made of weaving metal wires with 0.05-0.30 mm in diameter, and the thickness of the metal fiber layer is 3-30 mm. neither Richard nor Whitlock teach such features.

Claim 22 recites that the bottom diffusion mesh has a mesh size of 5-50 mesh and the inter-layer diffusion mesh has a mesh size of 10-60 mesh. Clearly, none of the cited references teaches or even remotely suggests these features. In such filtering systems as that of the present invention, dimension and mesh size of the filter layer not only matters, but is of great importance, which directly affect the filtering efficiency and results.

Claim 24 recites a sand control screen pipe, in which the composite metallic filtering mesh is disposed inside the multi-hole base pipe, instead of being disposed on the outer surface of the base pipe (See Fig. 8). None of Richard and Whitlock even remotely suggests such a feature. In addition, the differences discussed above in connection with claim 26 mostly also apply to claim 24.

Therefore, claim 24 is patentable over Richard and Whitlock. Claim 25 depends from claim 24 and, thus, is also patentable over Richard and Whitlock for at least the same reasons.

In addition, claim 25 contains features that further distinguish over the cited references. Claim 25 recites that the bottom diffusion mesh has a mesh size of 5-50 mesh and the inter-layer diffusion mesh has a mesh size of 10-60 mesh. Clearly, none of the cited references teaches or even remotely suggests these features

Claim 23 was rejected under 35 USC 103(a) as being unpatentable over Richard in view of Whitlock as applied to claim 20, and further in view of Ilfrey et al. (US 5,858,691).

Ilfrey was cited to teach the two or more support blocks recited in claim 23. However, Ilfrey clearly cannot cure the other deficiencies of Richard and Whitlock discussed above in connection with claim 26. Therefore, claim 26 is patentable over Richard, Whitlock, and Ilfrey. For at least the same reasons, dependent claim 23 (which depends on claim 26) is also patentable over Richard, Whitlock, and Ilfrey.

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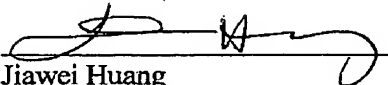
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In view of the foregoing amendments and remarks, it is respectfully submitted that the remaining claims are now in condition for allowance. Allowance of this application is earnestly solicited.

Information Disclosure Statement

Per requirement by the Examiner, Applicant encloses herewith a copy of CN 2441972Y, CN 243649Y, and JP 7279572A. Please make them of record.

Respectively submitted
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Annotated Marked-up drawing

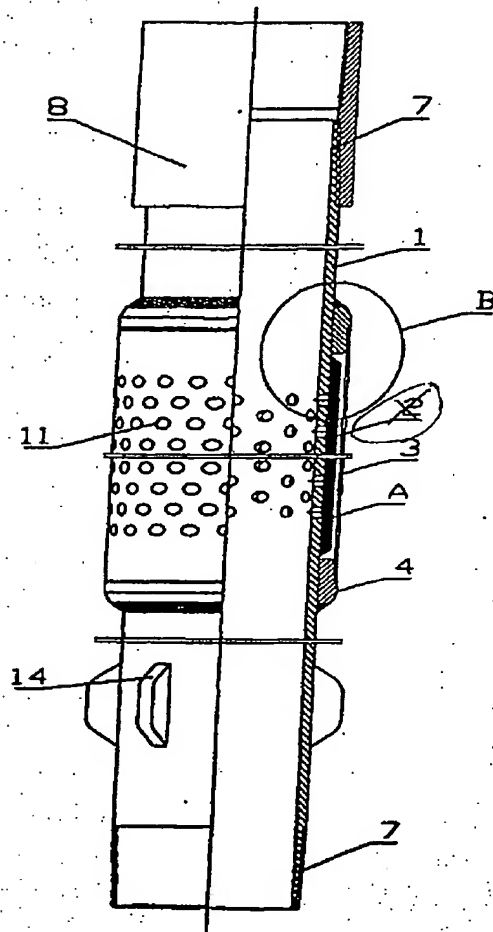


FIG. 6

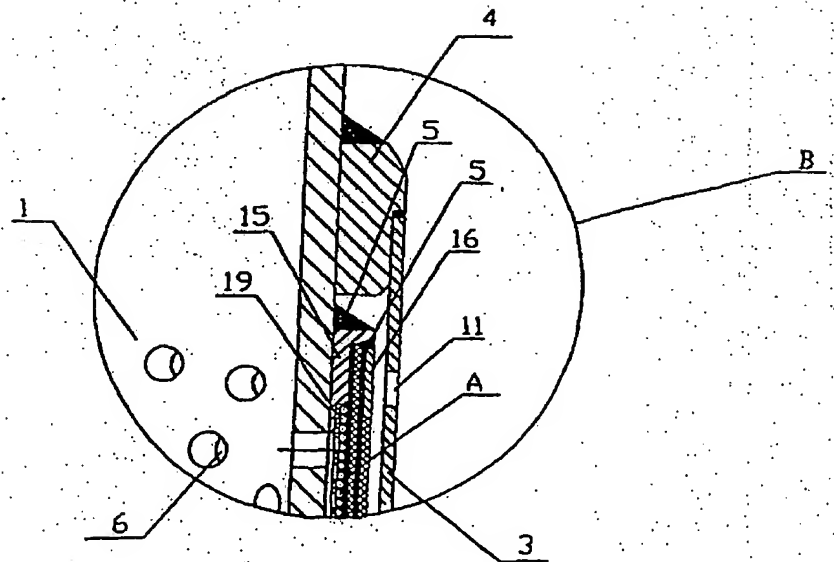


FIG. 7